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(T.C.JIS.MFR.ASSN./JSA)

Road vehicle—Tyre chains

ICS 43.040.99; 77.140.65; 83.160.10

Descriptors : private cars, tyres, chains, skid chains

Reference number : JIS D 4241 : 2000 (E)

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by the Tyre Chains Jis Manufacturers Association (T.C.JIS. MFR.ASSN.)/the Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law. Consequently **JIS D 4241 : 1993** is replaced with this Standard.

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Road vehicle—Tyre chains

1 Scope This Japanese Industrial Standard specifies steel tyre chains to be attached to wheel tyres for slip prevention of the automobile (excluding two-wheeled vehicles, industrial vehicles, construction machines and agricultural machines) during the runs on such a road as snowy, frozen and muddy (hereafter referred to as “chains”).

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS G 3101 *Rolled steels for general structure*

JIS G 3131 *Hot-rolled mild steel plates, sheets and strip*

JIS G 3505 *Low carbon steel wire rods*

JIS G 3532 *Low carbon steel wires*

JIS G 4106 *Manganese steels and manganese chromium steels for machine structural use*

JIS Z 2245 *Rockwell hardness test—Test method*

3 Definitions For the purposes of this Standard, the following main definitions apply (see Attached Fig. 1).

- a) **side chain** A part of chain comprising a required number of side links joined. Side links are symbolized by A, which is followed by a numeral (mm) representing the wire diameter.
- b) **cross chain** A part of chain comprising a required number of cross links joined. Cross links are symbolized by B, which is followed by a numeral (mm) representing the wire diameter.
- c) **connector** Metal parts for connecting a cross chain with side chains. These are symbolized by C, which is followed by a numeral (mm) representing the wire diameter.
- d) **end link** A link for connecting fastener plate with an end of side chain. It is symbolized by D, which is followed by a numeral (mm) representing the wire diameter.
- e) **fastener/hook** Metal fittings for coupling an end of side chain to adjust link. These are fastener plate (symbol E), hook wire (symbol G) and hook plate (symbol H). A numeral (mm) representing the wire diameter of the side link to be combined is attached following the respective symbols. Although those of the same numeral are combined in general, there may be the cases combining E5 with A6 and E7 with A8.
- f) **stopper** A metal part for preventing the fastener plate from becoming disengaged. It is symbolized by F, which is followed by a numeral (mm) representing the wire diameter. The wire diameter of F6 shall be 5 mm and of F9 shall be 8 mm.

- g) **adjust link** Links for adjusting the length of side chain in order to allow application of a chain of the same designation for tyres of several types.

4 Classification Chains shall be classified into 15 types as given in Table 1 according to the shape and nominal thickness.

Table 1 Classification of chains

Nominal thickness	Shape	
	1 (single type)	3 (triple type)
45	451 (Attached Table 1)	453 (Attached Table 2)
46	461 (Attached Table 3)	—
56	561 (Attached Table 4)	563 (Attached Table 5)
57	571 (Attached Table 6)	573 (Attached Table 7)
67	671 (Attached Table 8)	673 (Attached Table 9)
78	781 (Attached Table 10)	783 (Attached Table 11)
89	891 (Attached Table 12)	893 (Attached Table 13)
90	901 (Attached Table 14)	903 (Attached Table 15)

Remarks 1 Each Attached Table indicated in parentheses describes formation of the chain.

- 2 The classification of chains shall be expressed by the nominal thickness of chain (see 5.3.4) and the symbol representing the shape of chain (see 5.3.2).

Example:

Class 4 5 1
 Nominal thickness of chain —
 Shape of chain —

5 Quality

5.1 Performance

5.1.1 Appearance Chains shall be free from harmful points, burrs and the like as well as from cracks.

5.1.2 Surface hardness The surface hardness of cross links shall be as given in Table 2.

Table 2 Surface hardness

Symbol of cross link	Surface hardness
B5	76 HRA min.
B6	
B7	
B8	50 HRC min.
B9	
B10	

5.1.3 Strength The strength of chains shall be as follows:

- a) **Breaking strength** With the side chain and end link connected, when the tensile load given in Table 3 is applied, these shall not be broken.

Table 3 Breaking strength

Unit: kN

Side link and end link Symbol	Tensile load
A4 and D4	6.0
A5 and D5	10.0
A6 and D6	14.0
A7 and D7	20.0
A8 and D8	24.0
A9 and D9	32.0

- b) **Yield strength** With the side chain, end link, fastener plate, stopper and hook wire or hook plate connected according to the combination given in Table 4, when the tensile load of Table 4 is applied respectively, these shall be free from visible deformation and shall not remain exceeding 1 % in permanent elongation.

Table 4 Yield strength

Unit: kN

Side link, end link, fastener plate, stopper, hook wire, hook plate Symbol	Tensile load
A4, D4, E4 and F4	3.0
A4 and G4	
A4 and H4	
A5, D5, E5 and F5	5.0
A5 and G5	
A5 and H5	
A6, D6, E5 and F6	7.0
A7, D7, E7 and F7	10.0
A8, D8, E7 and F8	12.0
A9, D9, E9 and F9	16.0

5.2 Construction Chains shall be constructed as follows:

- Chains shall be so constructed as to be attached to and detached from the tyre with ease.
- Chains shall be comprised of a combination of side chains, cross chains, connectors, end link(s), fastener plate(s), stopper(s) and hook wire or hook plate. Attached Fig. 1 shows examples for such format of assembly.
- Attached Fig. 2 shows the shape and dimensions of the component parts of chain. The dimensions with no tolerance indicated are informative.
- Attached Table 16 shows the combination formats of chain component parts.
- For the cross chain of single type, after connecting one to the first link at the end link side of the side chains, to connect the specified number of cross chains at every fourth link, as shown in Attached Fig. 1.

Where a hook wire or hook plate is used, the connection shall be started from the second link of side chain in the hook wire or hook plate side.

- For triple types, the specified number of cross chains shall be connected at every second link alternately relative to the central side chain as shown in Attached Fig. 1.
- For class 451, 461 and 561 chains, a hook wire or hook plate may be used in only one side⁽¹⁾.
- The chain component parts shall be securely connected to each other and be smoothly movable.

Note (1) The car trail inside where it is attached.

5.3 Shape and dimensions

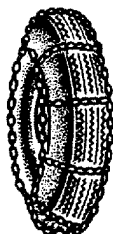
5.3.1 Formation of chains Attached Tables 1 to 15 give the formation of cross chain and side chain according to the combination of the classification and size of chains.

5.3.2 Shape of chain The shape of chains shall be divided by the use as shown in Table 5 (see Attached Fig. 1).

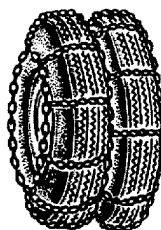
Table 5 Shape of chain

Shape	Use	Division
1	For single wheel	Single type
3	For double wheel	Triple type

Single type



Triple type



5.3.3 Size of chain The size of chains shall be expressed by the number of links in a cross chain and number of cross chains contained as given in Table 6.

Table 6 Size of chain

Number of cross links of a cross chain	Number of cross chains							
	8	9	10	11	12	13	14	15
6	68	69	60	61	62	—	—	—
7	78	79	70	71	72	73	—	—
8	88	89	80	81	82	83	84	85
9	98	99	90	91	92	93	94	95
10	08	09	00	01	02	03	04	05
11	18	19	10	11	12	13	14	—
12	28	29	20	21	22	23	24	—
13	38	39	30	31	32	33	34	—

Remarks : The size of chains is expressed by the number of cross links of a cross chain and the number of cross chains following thereto. For those of which the number of cross links of a cross chain or the number of cross chains is double figures, the numeral of first place shall be taken.

5.3.4 Thickness of chain The nominal thickness of chains shall be expressed by the combination of wire diameters of the side chain and cross chain, as given in Table 7.

Table 7 Thickness of chain

Unit: mm

Nominal thickness	Wire diameter of side chain	Wire diameter of cross chain
45	4	5
46	4	6
56	5	6
57	5	7
67	6	7
78	7	8
89	8	9
90	9	10

5.3.5 Designation of chain Chains shall be designated by the classification and size of chain with the arrangement in the order as shown in the following example.

Example: Designation of chain

4 5 1 6 9

Classification of chain { Nominal thickness of chain ————
Shape of chain ————
Size of chain ————

6 Materials The material of chains shall be as given in Table 8.

Table 8 Materials

Name of parts	Material
Side link	SWM-B or SWM-F of JIS G 3532 produced by using SWRM6, SWRM8, SWRM10 or SWRM12 of JIS G 3505
Cross link	
Connector	
End link	
Stopper	
Fastener plate	SS400 of JIS G 3101 or SPHC of JIS G 3131
Hook plate	
Hook wire	SMn420 of JIS G 4106 or that at least equivalent thereto